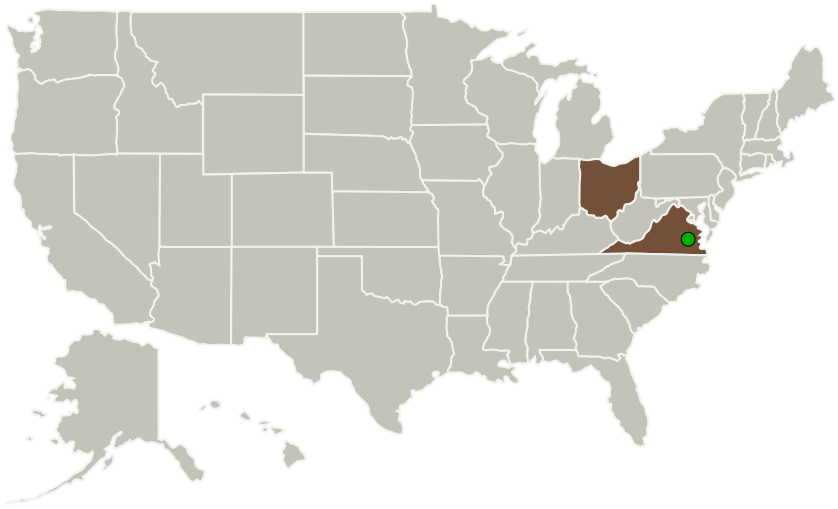
Adaptive Liners for Broadband Noise Reduction, Phase I

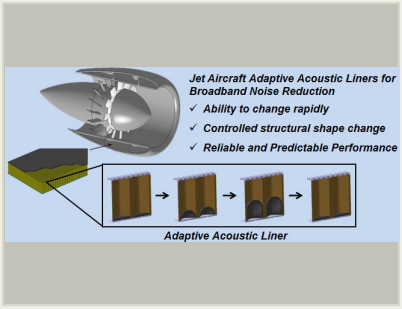
Completed Technology Project (2014 - 2014)

Project Introduction

This project will combine the advantages of adaptive materials with the simplistic passive design of state-of-the-art acoustic liners to provide the ability to tune them for specific operational frequencies (ex. take-off/cutback, cruise, and approach). The main deterrent to implementing these methods is not having the materials on hand to provide the functionality needed in a simplistic way. Many proposed solutions are not practical from a manufacturing/cost perspective: too complex or add weight to the aircraft that is not justifiable. CRG has already demonstrated feasibility of the ability to implement adaptive technologies into acoustic liners. The next step is to demonstrate repeatable liner control performance supported by more extensive acoustic testing runs to understand the initial shifting and increased suppression behaviors that have been observed. Also, automated cyclic testing of a given adaptive liner parameter will be executed to demonstrate the durability of the adaptive material and applicability to this application. CRG will focus liner adaptive design initially on demonstration of tuning liner reactance to TRL 3 in Phase I.

Primary U.S. Work Locations and Key Partners





Adaptive Liners for Broadband Noise Reduction Project Image

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Organizations Performing Work	Role	Type	Location
Cornerstone Research Group, Inc.	Lead Organization	Industry	Miamisburg, Ohio
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Ohio	Virginia

Project Transitions

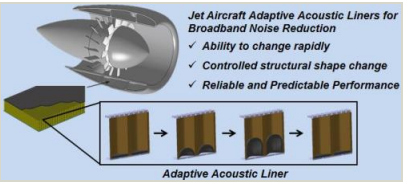
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140507)*

Images



Project Image
Adaptive Liners for Broadband Noise Reduction Project Image *(https://techport.nasa.gov/image/126885)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Cornerstone Research Group, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Jason Hermiller

Co-Investigator:
Jason Hermiller

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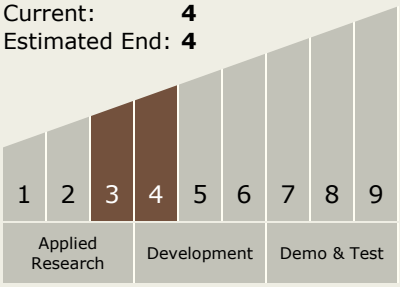
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.5 Nondestructive Evaluation and Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System